

## Trend Study 17-24-02

Study site name: Heisetts Hollow.

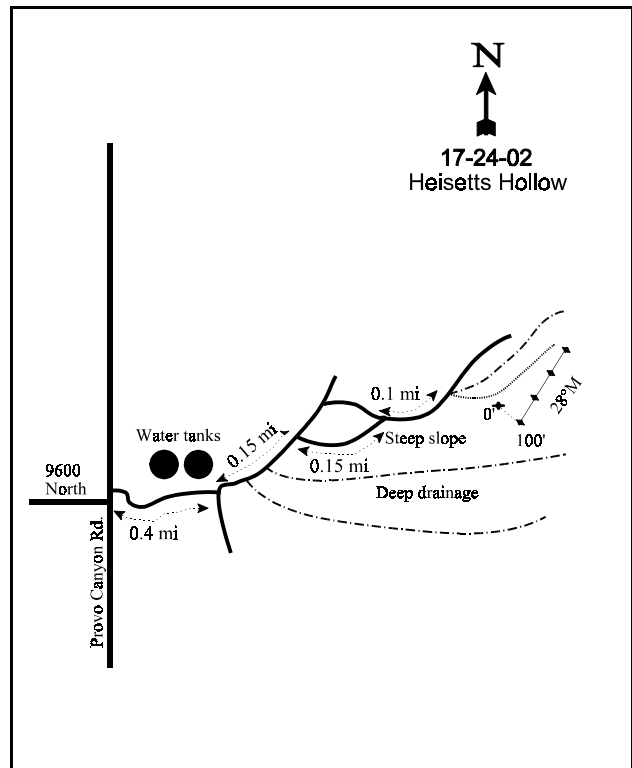
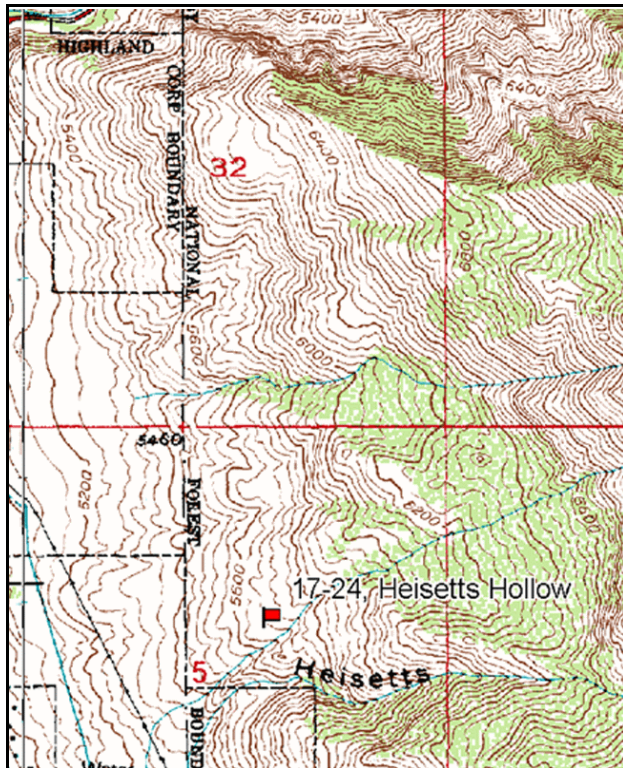
Vegetation type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 136 degrees magnetic (lines 2-4 @ 28°M).

Frequency belt placement: line 1 (11 & 95ft), line 2 (59ft), line 3 (34ft), line 4 (71ft). Rebar: belt 1 on 18 ft., belt 3 on 2ft.

### LOCATION DESCRIPTION

North of Pleasant Grove, turn east off Canyon Road (Rt 146) opposite 9600 North, and go 0.4 miles towards the water tank on the hill. From the southeast side of the concrete tank, go northerly 0.15 miles to a fork. Bear right up the steep, easternmost road, and continue 0.15 miles to the Forest Service boundary. Go 0.1 miles to a fork, continue east 0.1 miles up a steep slope to a small level area. A deer trail goes southeast. Follow the trail 65 paces to the 0-foot baseline stake.



Map Name: Timpanogos Cave

Diagrammatic Sketch

Township 5S, Range 2E, Section 5

GPS: NAD 27, UTM 12S 4473918 N 437113 E

## DISCUSSION

### Heisetts Hollow - Trend Study No. 17-24

This study is located on the upper Lake Bonneville terrace near the mouth of Heisetts Hollow and uphill from the Salt Lake Aqueduct. This entire area is critical deer winter range. An old browse transect which samples the few Stansbury cliffrose plants is located in the immediate area. Slope varies from about 5% at the 0 foot baseline stake to nearly 22% at the end of the baseline. Aspect is southwest and elevation is 5,600 feet. The range type is sparse mountain big sagebrush interspersed with isolated oak clumps and large cliffrose plants. A moderately dense and vigorous perennial grass cover occupies the shrub interspaces. Quadrat frequency of deer pellet groups was moderately high in 1997 and 2002 at 43% and 46% respectively. A pellet group transect read on site in 2002 estimated 65 deer and 3 elk days use/acre (160 ddu/acre and 8 edu/ha). All of the deer pellet groups appeared to be from winter use.

Soil is a clay loam containing a moderate amount of rock in the profile. Texture is gravelly to sandy and typical of sedimentary lake deposits. Effective rooting depth is estimated at 24 inches, some of which is an unconsolidated "C" horizon. Phosphorous is low at only 5.7 ppm. Values less than 10 ppm may limit normal plant growth and development. The steeper slopes show signs of erosion problems in the past, leaving behind some steep terraces as well as some pedestalling of the plants. Some soil movement is evident on a foot trail located directly north of the site. There did not appear to be any significant erosion occurring on site in 1997 or 2002, and the erosion condition class was determined to be stable in 2002.

The key browse species is a sparse population of mountain big sagebrush. The greatly increased sample size used in 1997 estimated density at 1,120 plants/acre, a slight increase from the 866 plants/acre estimated in 1983 and 1989. Utilization was moderate to heavy. The number of heavily hedged plants declined in 1997 and vigor improved. Decadency also declined to 23% in 1997. Density was estimated at 920 plants/acre in 2002. Use was very heavy, similar to 1989 levels, and the number of decadent plants nearly doubled to 41% of the population. Half of the decadent plants were classified as dying in 2002. Young recruitment is marginal with young plants accounting for only 7% of the population. Annual leader growth on sagebrush averaged 1.9 inches in 2002.

Other preferred browse occur in small numbers and include true mountain mahogany, white rubber rabbitbrush, and cliffrose. The few cliffrose on the site are tall and mostly unavailable to browsing. They do not appear to be reproducing. One disturbing aspect of the browse composition was the high density of broom snakeweed in 1997 which was estimated at 10,300 plants/acre, an increase from 1,433 plants/acre in 1989. The number of seedlings encountered in 1997 was also high, but due to drought the population declined to only 120 plants/acre in 2002.

Perennial grasses are the dominant herbaceous understory component. With the exclusion of livestock grazing, bluebunch wheatgrass is becoming vigorous and abundant. It comprises a uniform but somewhat open cover that helps stabilize soil. Bulbous bluegrass is also abundant and accounted for 43% of the grass cover in 1997 and 55% in 2002. Cheatgrass is present but not very abundant.

The forb component is subject to grass competition. As a result, forbs are diverse but occur infrequently. The more common species include northern sweetvetch, longleaf phlox, ragweed, and scarlet globemallow. Little vegetative cover or forage is provided by forbs.

### 1983 APPARENT TREND ASSESSMENT

Soil at the site appears stable on a highly erodible and fragile site. Past erosion has been severe but is slowly being stabilized by an aggressive and increasing perennial grass cover. Browse for big game habitat purposes appears to be in a state of decline. All the available evidence points to a rapidly decreasing population of mountain big sagebrush, the key browse species. Other desirable browse species occur in small numbers. Broom snakeweed is abundant and appears to be increasing.

### 1989 TREND ASSESSMENT

This section of the hill is subject to slumping, and recent cracking and soil movement has occurred. It appears the site will slide down into the large gully below. Adjacent slopes are subject to severe gullying. The site has adequate grass cover, however litter cover has decreased. Some of the decrease in litter cover is probably due to classifying cured bulbous bluegrass as litter in 1989. Pavement cover increased from 7 to 20%. The 12.5% cover of bare soil exposed is similar between years. The soil trend is stable. Density of the key browse species, mountain big sagebrush, is stable. Use is heavy and the number of decadent plants increased. The 1989 data demonstrate that the increaser subshrub broom snakeweed is not a good indicator of trend. Although it was apparently rapidly expanding in 1983, the snakeweed now has a largely decadent population. The short oakbrush on the site is heavily hedged and has expanded slightly. No changes are apparent in the heavily browsed cliffrose population and the infrequent shrubs were not adequately sampled. Trend for browse is considered stable. Perennial grasses still predominate in the understory. Trend for the herbaceous understory is up slightly. There appears to have been a problem differentiating Sandberg bluegrass and bulbous bluegrass. Sum of nested frequency of perennial grasses and forbs increased.

#### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up slightly (4)

### 1997 TREND ASSESSMENT

The soil trend is stable. Some past erosion has occurred as well as plant pedestalling. Current erosion does not appear to be accelerated and not more than would be suspected. The adjacent foot trail shows sign of erosion which could adversely effect the site. The mountain big sagebrush population is moderate to heavily hedged, but the percentage of the population with heavily hedged plants has declined since 1989. Seedling and young plants are sparse with 70% of the plants encountered classified as mature. The broom snakeweed population has exploded to over 10,000 plants/acre estimated in 1997. The browse trend is up slightly for the key browse species, mountain big sagebrush. Nested frequency for bluebunch wheatgrass continues to increase with only a sparse cover of cheatgrass. Bulbous bluegrass also has a high cover value with a very short growth form. Forbs are insignificant on the site at this time. It appears that much of the bulbous bluegrass was classified as Sandberg bluegrass in 1989. Herbaceous trend is up slightly.

#### TREND ASSESSMENT

soil - stable (3)

browse - up slightly (4)

herbaceous understory - up slightly (4)

## 2002 TREND ASSESSMENT

Trend for soil is down slightly. Cover of bare ground nearly doubled from 7.5% cover to 14.7%. Litter and vegetation cover also declined. There is still adequate protective ground cover to prevent most erosion. Trend for the key browse species, mountain big sagebrush, is down slightly. Density is similar to 1997, but use is heavier and the number of decadent plants has increased. In addition, 53% of the decadent plants sampled were classified as dying. Recruitment is marginal with 7% of the population consisting of young plants. Sagebrush is definitely feeling the effects of drought. Drought conditions have also caused a dramatic decline in the broom snakeweed population. The very high density of 10,300 plants/acre estimated in 1997 has declined to only 120 plants/acre in 2002. Trend for the herbaceous understory is stable. The composition of the herbaceous understory has changed slightly, but the sum of nested frequency for perennial grasses remained similar to 1997. Nested frequency of bluebunch wheatgrass declined, while the frequency of the poor value perennial, bulbous bluegrass, remained stable. Sum of nested frequency for perennial forbs declined slightly.

### TREND ASSESSMENT

soil - down slightly (2)

browse - down slightly (2)

herbaceous understory - stable (3)

### HERBACEOUS TRENDS --

Herd unit 17 , Study no: 24

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron cristatum	<sub>b</sub> 9	<sub>b</sub> 7	<sub>a</sub> -	<sub>a</sub> -	5	5	-	-	-	-
G	Agropyron dasystachyum	<sub>b</sub> 86	<sub>a</sub> 8	<sub>a</sub> -	<sub>a</sub> 2	33	4	-	1	-	.00
G	Agropyron spicatum	<sub>a</sub> 196	<sub>a</sub> 237	<sub>c</sub> 289	<sub>b</sub> 254	76	82	85	85	20.39	13.22
G	Bromus tectorum (a)	-	-	<sub>b</sub> 133	<sub>a</sub> 39	-	-	49	14	1.51	.19
G	Poa bulbosa	<sub>b</sub> 284	<sub>a</sub> 120	<sub>c</sub> 307	<sub>c</sub> 303	89	59	89	88	16.68	19.25
G	Poa pratensis	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 42	-	-	-	16	-	.59
G	Poa secunda	<sub>a</sub> -	<sub>c</sub> 299	<sub>b</sub> 28	<sub>b</sub> 32	-	95	14	13	.17	1.48
Total for Annual Grasses		0	0	133	39	0	0	49	14	1.51	0.19
Total for Perennial Grasses		575	671	624	633	203	245	188	203	37.25	34.56
Total for Grasses		575	671	757	672	203	245	237	217	38.76	34.76
F	Alyssum alyssoides (a)	-	-	<sub>b</sub> 128	<sub>a</sub> 87	-	-	49	32	.49	.18
F	Allium spp.	-	-	3	-	-	-	1	-	.00	-
F	Ambrosia psilostachya	<sub>a</sub> -	<sub>c</sub> 52	<sub>b</sub> 35	<sub>a</sub> 4	-	27	15	3	.18	.06
F	Artemisia ludoviciana	3	2	-	-	1	1	-	-	-	-
F	Arabis perennans	-	-	2	-	-	-	1	-	.03	-
F	Astragalus spp.	-	2	-	17	-	1	-	10	-	.35
F	Astragalus utahensis	-	-	3	6	-	-	1	3	.15	.06
F	Castilleja chromosa	7	1	2	5	3	1	1	3	.00	.04
F	Calochortus nuttallii	7	1	-	4	4	1	-	2	-	.01
F	Cirsium undulatum	<sub>a</sub> -	<sub>a</sub> 2	<sub>b</sub> 11	<sub>b</sub> 12	-	1	8	7	.19	.09
F	Comandra pallida	4	8	3	-	2	3	3	-	.01	-

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	<i>Crepis acuminata</i>	-	-	5	7	-	-	2	3	.01	.04
F	<i>Descurainia pinnata</i> (a)	-	-	-	5	-	-	-	2	-	.01
F	<i>Erodium cicutarium</i> (a)	-	-	44	55	-	-	19	22	.26	1.37
F	<i>Helianthus annuus</i> (a)	a-	b17	a-	b14	-	7	-	7	-	.03
F	<i>Hedysarum boreale</i>	ab12	ab11	b26	a4	6	5	11	3	.71	.16
F	<i>Lappula occidentalis</i> (a)	-	-	a-	b23	-	-	-	10	-	.05
F	<i>Lactuca serriola</i>	-	-	1	5	-	-	1	2	.00	.01
F	<i>Lithospermum ruderales</i>	-	3	3	-	-	2	2	-	.01	-
F	<i>Lygodesmia</i> spp.	a-	a-	a-	b13	-	-	-	5	-	.12
F	<i>Oenothera</i> spp.	2	-	5	1	1	-	3	1	.33	.00
F	<i>Orobancha</i> spp.	5	-	-	-	2	-	-	-	-	-
F	<i>Phlox longifolia</i>	a3	ab6	c28	bc21	1	4	12	11	.08	.08
F	<i>Sedum lanceolatum</i>	-	-	-	1	-	-	-	1	-	.00
F	<i>Sphaeralcea coccinea</i>	8	7	6	13	4	2	2	7	.03	.03
F	<i>Tragopogon dubius</i>	ab2	a-	c31	b7	2	-	14	5	.24	.10
F	Unknown forb-perennial	-	3	-	-	-	1	-	-	-	-
Total for Annual Forbs		0	17	172	184	0	7	68	73	0.76	1.64
Total for Perennial Forbs		53	98	164	120	26	49	77	66	2.00	1.19
Total for Forbs		53	115	336	304	26	56	145	139	2.76	2.84

Values with different subscript letters are significantly different at alpha = 0.10

#### BROWSE TRENDS --

Herd unit 17 , Study no: 24

T y p e	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	<i>Artemisia tridentata vaseyana</i>	35	32	8.28	6.99
B	<i>Atriplex confertifolia</i>	1	1	.03	.15
B	<i>Cercocarpus montanus</i>	1	1	.15	.41
B	<i>Chrysothamnus nauseosus albicaulis</i>	4	2	.15	.03
B	<i>Cowania mexicana stansburiana</i>	0	0	-	.15
B	<i>Gutierrezia sarothrae</i>	72	6	3.59	.01
Total for Browse		113	42	12.21	7.75

# CANOPY COVER --

Herd unit 17 , Study no: 24

Species	Percent Cover	
	'97	'02
Artemisia tridentata vaseyana	-	2

# Key Browse Annual Leader Growth

Herd unit 17 , Study no: 24

Species	Average leader growth (in) '02
Artemisia tridentata vaseyana	1.9

# BASIC COVER --

Herd unit 17 , Study no: 24

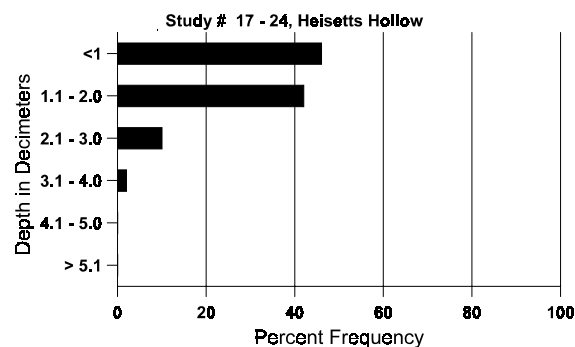
Cover Type	Nested Frequency		Average Cover %			
	'97	'02	'83	'89	'97	'02
Vegetation	381	367	7.00	22.25	53.82	49.99
Rock	172	211	3.00	4.50	4.96	7.68
Pavement	245	260	6.75	19.75	6.84	8.94
Litter	388	373	72.50	41.00	39.14	31.17
Cryptogams	43	18	.25	0	.59	.22
Bare Ground	190	224	10.50	12.50	7.46	14.68

# SOIL ANALYSIS DATA --

Herd Unit 17, Study no: 24, Heisetts Hollow

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
24.3	49.6 (17.7)	7.1	32.0	35.4	32.6	3.8	5.7	105.6	.6

# Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 24

Type	Quadrat Frequency		Pellet Transect	
	'97	'02	Pellet Groups per Acre 02	Days Use per Acre (ha) 02
Rabbit	1	3	-	-
Bighorn Sheep	-	1	-	-
Elk	1	1	44	3 (8)
Deer	43	46	844	65 (160)
Horse	-	-	9	N/A

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 24

Form Class (No. of Plants)																			Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
A Y G R E		1	2	3	4	5	6	7	8	9	1	2	3	4												
Amelanchier alnifolia																										
M	83	-	-	1	-	-	-	-	-	-	-	-	1	-	33	30	35	1								
	89	-	-	1	-	-	-	-	-	-	-	-	-	1	33	28	31	1								
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0								
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0								
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>												
		'83				00%				100%				100%												
		'89				00%				100%				100%												
		'97				00%				00%				00%												
		'02				00%				00%				00%												
Total Plants/Acre (excluding Dead & Seedlings)														'83	33	Dec:	-									
														'89	33		-									
														'97	0		-									
														'02	0		-									

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	83	-	-	1	-	-	-	-	-	-	1	-	-	-	33		1	
	89	-	1	-	-	-	-	-	-	-	1	-	-	-	33		1	
	97	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	02	1	2	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	83	-	8	12	-	-	-	-	-	-	15	-	-	5	666	22	28	20
	89	-	1	12	-	-	-	-	-	-	12	1	-	-	433	24	29	13
	97	-	23	15	1	-	-	-	-	-	39	-	-	-	780	25	47	39
	02	-	2	21	-	1	-	-	-	-	23	-	1	-	480	22	35	24
D	83	-	1	1	3	-	-	-	-	-	1	-	1	3	166			5
	89	-	2	10	-	-	-	-	-	-	10	1	-	1	400			12
	97	4	7	2	-	-	-	-	-	-	5	1	-	7	260			13
	02	1	-	18	-	-	-	-	-	-	8	1	-	10	380			19
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	300			15
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		35%			54%			35%			+ 0%							
'89		15%			85%			04%			+23%							
'97		54%			30%			13%			-18%							
'02		11%			85%			24%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	865	Dec:	19%			
												'89	866		46%			
												'97	1120		23%			
												'02	920		41%			
Atriplex confertifolia																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	1	-	-	-	-	-	-	-	1	-	-	-	20	15	27	1
	02	-	-	1	-	-	-	-	-	-	1	-	-	-	20	6	16	1
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		00%			00%			00%										
'97		100%			00%			00%			+50%							
'02		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	0%			
												'89	0		0%			
												'97	20		0%			
												'02	40		50%			



A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	1	-	-	-	-	-	-	-	-	-	-	33		1	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	97	-	-	1	-	-	-	-	-	-	-	-	-	-	20	70 127	1	
	02	-	-	-	-	2	-	-	-	-	-	-	-	-	40	89 113	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		00%			100%			00%			-39%							
'97		00%			100%			00%			+50%							
'02		100%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-			
												'89	33		-			
												'97	20		-			
												'02	40		-			
Chrysothamnus nauseosus albicaulis																		
M	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33	20 24	1	
	89	2	-	-	-	-	-	-	-	-	-	2	-	-	66	26 26	2	
	97	4	-	-	-	-	-	-	-	-	3	1	-	-	80	28 48	4	
	02	-	1	-	-	-	-	-	-	-	1	-	-	-	20	27 44	1	
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	1	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%			+50%							
'89		00%			00%			00%			+18%							
'97		00%			00%			00%			-50%							
'02		50%			50%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	33	Dec:	0%			
												'89	66		0%			
												'97	80		0%			
												'02	40		50%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cowania mexicana stansburiana																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	38	48	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	66	57	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		00%			00%			00%										
'97		00%			00%			00%										
'02		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-			
												'89	0		-			
												'97	0		-			
												'02	0		-			
Gutierrezia sarothrae																		
S	83	123	-	-	-	-	-	-	-	-	123	-	-	-	4100			123
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	445	-	-	-	-	-	-	-	-	445	-	-	-	8900			445
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	22	-	-	-	-	-	-	-	-	22	-	-	-	733			22
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	214	-	-	-	-	-	-	-	-	214	-	-	-	4280			214
	02	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
M	83	15	-	-	-	-	-	-	-	-	15	-	-	-	500	11	8	15
	89	22	-	-	-	-	-	-	-	-	16	-	6	-	733	9	8	22
	97	299	-	-	-	-	-	-	-	-	299	-	-	-	5980	6	7	299
	02	4	-	-	-	-	-	-	-	-	3	-	1	-	80	7	7	4
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	21	-	-	-	-	-	-	-	-	8	-	10	3	700			21
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%			+14%							
'89		00%			00%			44%			+86%							
'97		00%			00%			00%			-99%							
'02		00%			00%			17%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	1233	Dec:	0%			
												'89	1433		49%			
												'97	10300		0%			
												'02	120		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Quercus gambelii																		
Y	'83	-	-	1	-	-	-	-	-	-	-	-	1	-	33		1	
	'89	-	-	5	1	-	-	-	-	-	2	4	-	-	200		6	
	'97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	'83	-	1	2	-	-	-	-	-	-	2	-	1	-	100	33 35	3	
	'89	-	-	4	-	-	1	-	-	-	5	-	-	-	166	59 33	5	
	'97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	52 43	0	
	'02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		25%			75%			50%			+64%							
'89		00%			91%			00%										
'97		00%			00%			00%										
'02		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	133	Dec:	-			
												'89	366		-			
												'97	0		-			
												'02	0		-			